By Matthew J. Frederickson

Get Your Green On!

Council Rock School District in Pennsylvania set out five years ago to cut energy costs. By involving students, teachers, and facilities staff in the effort, the district saved $7 million and created a culture of conservation.

In the span of five years, the staff and students at Council Rock School District in Pennsylvania won three Energy Star Awards, saved more than $7 million, and completely changed the culture of the district. How did we do it? With very little effort on our part, actually.

We are the ninth largest district in Pennsylvania and serve about 12,500 students. We have approximately 1,400 employees and 18 buildings spread out over 72 square miles. In 2005, our relatively new superintendent decided to invest in a program to reduce the district's energy costs. He gathered a group of administrators, facilities staff, and teachers to solicit ideas about energy conservation.

The facilities manager recommended bringing in an expert to evaluate consumption and suggest ways to cut costs. The teachers recommended a conservation campaign in the schools. Both courses of action made a huge difference.

Getting Students Involved

The teachers went back to their schools and formed environmental action clubs (EACs). They asked for student volunteers, and each school identified a single goal for the year. The goals ranged from planting trees to recycling efforts.

Initially, these groups started with one or two students. They met with their teacher advisers and planned their projects. But what started as a small group quickly spread to the entire school. One EAC, for example, decided to take on a recycling project. They contacted their local refuse collector to get special containers for glass, plastic, and paper. Next, they taught the custodial staff, teachers, and students how to separate their recyclables. They linked this conservation effort back to the classrooms, where they discussed the environment, biology, and weather.

The response from the students was overwhelming, and soon the movement to recycle spread into the community. Local business owners said many of the students they hired were driving them to reduce energy consumption as well. There was a cultural shift within the district. Our motto became "Get Your Green On."

Looking for Energy Hogs

On the facilities side, we hired an energy consulting firm for a five-year contract. Consultants were to be onsite full time during the first three years but would gradually turn the program over to school officials in the final two years.

They calibrated the heating, ventilating, and air conditioning (HVAC) units so that they opened and closed properly and established some monthly reporting procedures. They began

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publishing a monthly newsletter on the district website to report energy savings across the district and at individual schools.

During the first meeting with our consultant, he told us that the biggest obstacle he usually found in schools was getting all the systems (HVAC and others) on the network. Fortunately, we had recently upgraded our network using Cisco switches, so connectivity was not a problem.

Developing Policies

As we embarked on this plan, we knew that each dollar we saved was a dollar that we could allocate elsewhere for school programs or reinvest into technology or other solutions. But getting from point A to point B required a very structured process. The first step was establishing a policy at the board level. Using best-practices models from around the country, we developed a policy that established:

- Appropriate temperature ranges for classrooms, gyms, and auditoriums (both when occupied and when unoccupied)
- Appropriate lighting throughout the schools
- Appropriate use of personal equipment, such as coffee pots and mini-refrigerators

Next we determined specifically who in each building was responsible for which parts of the policy. At the building level, the EACs and their advisers reviewed the policy and figured out how to implement it. Once the groups developed their school-wide plans, they shared them with the entire staffs and student bodies of each building and began to track the progress.

This is where the students in the EACs became the movers and the shakers. They monitored the building progress and reported the findings to their peers. They inspired their teachers and other staff members not only to embrace the concepts but to change their behavior in ways that moved the program forward. Often it was small things—such as convincing teachers to turn off the lights when exiting the classroom or planting trees and flowers in the common areas—that ultimately made the difference.

On the district front, the next challenge was establishing benchmarks. Using guidelines from the U.S. Environmental Protection Agency, we determined what we would measure and how we would report it. We set goals for the first year and established when to revisit them. We also clearly identified who was going to be doing what, when they were expected to do it, and how it was going to be reported. Then we published the plan on our website.

Getting Recognition

The effort fostered competition between buildings, which drove the program faster than we originally anticipated. We had expected seeing slight savings each year; we did not believe that we would receive Energy Star recognition by our third year (see "Energy Star Rating" on page 26).

The plan became a living document that evolved as our level of understanding and experience grew. If something wasn't working, we changed it. It also provided the opportunity to celebrate our successes.

Turning Off Computers

IT jumped in to do its part. The obvious first place to look for energy conservation was the data center. Most data centers are fixed in size, and once the usual suspects—HVAC systems, server size, and power supplies—have been addressed, many IT departments stop looking for savings. But according to the Energy Star website, the best places to realize energy savings is at the building level, where the technology is dispersed. We used two different tools—EnergyWise from Cisco and Ghost from Symantec—and saved the district approximately $100,000 per

Turn Off to Save Money

Wattage x Hours Used Per Day / 1,000 x Cost Per Kilowatt Hour = Total Cost

Assuming a typical PC averages 133 watts per day, this is how we calculated the cost to power a PC:

8-hour workday x 133 = 1,064 watts
16 hours rest x 65 = 1,040 watts
Total daily usage = 2,104 watts, 2.104 kWh
Average kWh rate of $0.15
Average power consumption charge = 2.104 x 0.15 = $0.32
Average annual cost: $115.19

The annual cost of leaving the district's 2,000 computers on all the time is about $230,388.

By turning the PCs off at the end of the school day, we saved an average of 12 hours per PC. Here's how we calculated the savings:

12 hours x 65 watts x 365 days = 284,700 watts per year
284,700 watts per year / 1,000 = 284.7 kWh per year
284.7 x $ 0.15 = $ 42.71 per year, per PC

$42.71 x 2,000 PCs = $85,410 annual savings

Here is how much we saved by shutting down access points and VoIP phones when not in use:

Access Points

211 APs at 15 watts per unit x 24 hours = 75,960 watts per day
$11.39 per day (for all 211), or $4,159 per year

12-hour shut down each day = $2,079 per year in savings

IP Powered Phone

265 phones at 5 watts, or 120 watts per day
$4.77 per day (for all 265), or $1,741 per year

12-hour shut down each day = $871 per year in savings

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Energy Star Rating

Energy Star is an energy performance rating system developed by the U.S. Environmental Protection Agency. The ratings, on a scale of 1–100, are used to compare the energy efficiency of similar buildings and industrial plants.

Buildings that get a rating of 75 or higher may qualify to be designated as an Energy Star facility. Schools interested in participating in the recognition program can register to use the EPA's free online Portfolio Manager (www.energystar.gov/istar/pmpam) to determine how well the school is doing compared to similar schools.

Portfolio Manager is an interactive energy management tool that allows building officials to track and assess energy and water consumption. For more information, visit the Energy Star website (www.energystar.gov).

year. Once you understand the calculations, it's easy to see how quickly you can save money.

We started with desktop management. At that time, we were leaving our PCs on all the time so we could do our updates and refreshing during nonschool hours. Even when we were not installing updates, the PCs were left on, so that on a typical workday, the PCs were on but not used for an average of 12 hours. With normal use, a PC can gobble up about 250 watts; in hibernate mode it uses about 65 watts. A laptop uses anywhere from 15 to 45 watts, a 17" CRT monitor uses 80 watts, and a 17" LCD monitor consumes 35 watts. The easy cost-saving approach would be to turn PCs off when they aren't being used (see "Turn Off to Save Money").

We didn't stop there. We have an extensive wireless presence in each of our buildings as well as a VoIP phone system. EnergyWise is a product included in the operating system for some Cisco switches. It allows users to turn Power over Ethernet (PoE) devices on or off. Because our access points (wireless antennas) and phones are PoE devices, I can shut them down when they aren't needed (see "Turn Off to Save Money").

I used the U.S. Environmental Protection Agency's calculator to determine the equivalent in greenhouse gas savings realized by our improved energy efficiency. I discovered that turning off all district PCs, access points, and IP-powered phones during nonschool hours is the equivalent of planting 10,740 trees, taking 80 cars off the road, and powering 54 homes for a year. Although your savings will vary, I hope our experience has given you some ideas about things you can do when you get your entire school or district motivated to get their green on!

Resources

Energy Star: http://www.energystar.gov

Saving Electricity: http://michaelblue jay.com/electricity/computers.html

University of Pennsylvania Information Systems & Computing: www.upenn.edu/computing/provider/docs/hardware/powerusage.html

U.S. Department of Energy website: www.energysavers.gov/your_home/appliances/index.cfm/mytopic=10040

U.S. Environmental Protection Agency website: www.epa.gov/RDEE/energy-resources/calculator.html

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